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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/624,593	07/23/2003	Kei Hayasaki	04329.3100	7500

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EXAMINER	
DUDA, KATHLEEN	

ART UNIT	PAPER NUMBER
1756	

DATE MAILED: 11/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/624,593	HAYASAKI ET AL.	
	Examiner	Art Unit	
	Kathleen Duda	1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *8/18/2006 and 10/23/2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *3-20,23-32,35-40 and 43-133* is/are pending in the application.

4a) Of the above claim(s) *49-131* is/are withdrawn from consideration.

5)☒ Claim(s) *3-20,132 and 133* is/are allowed.

6)☒ Claim(s) *23-25,27,28,35-40 and 43-48* is/are rejected.

7)☒ Claim(s) *26,29-32,38 and 46* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *08182006 and 10232006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 3-20, 23-32, 35-40 and 43-133 are currently pending in this application. Claims 49-131 have been non-elected without traverse in the reply submitted on July 13, 2005.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 35-40 and 43-48 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 35, 37, 43 and 45 recite forming a pattern of photosensitive resin film by supplying a developing solution to photosensitive resin film of which the surface layer has been slimmed. However these claims previously recited that the photosensitive resin was reformed (not slimmed) and the examiner has been unable to locate any support for this amendment in the

original specification. The specification discusses slimming the photosensitive resin pattern after developing (Embodiment 1 and 2) and reforming the photosensitive resin after exposure but prior to development and reforming the developed pattern (Embodiment 3). There is no recitation or examples of performing a slimming process prior to development and pattern formation, as recited in the amended claims 35, 37, 43 and 45.

Applicant responded to this rejection by stating that the material of the claims was present in original claim 1. However, there is not an explanation for what "reforming" actually means in the originally filed specification.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 35-40 and 43-48 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 23 and 25 recite that a reforming of a "pattern" occurs. The language of the claim does not make it clear that a pattern is formed at this point since a developing step follows. Clarification is required.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 23-25 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Ema (US 6,372,413).

A photoresist is formed on substrate 11, exposed through a mask and developed. The substrate was then subjected to a rinsing process in which deionized water containing 3-ppm ozone gas was applied, thereby oxidizing and decomposing resist residues 14A (reforming). See col.3, 9-50. Ozone water is produced by supplying deionized water containing oxygen to a light irradiation unit emitting VUV light of 172 nm. See col.7, 34-45.

Applicant argues that Ema does not teach reforming. Page 5 teaches that the layer is processed with activated water. "Reforming" is not defined in the specification.

Page 45, lines 13-21 (cited by Applicant) teach oxidation of a resist pattern with exposure to activated water. Ema teaches exposure to activated water which leads to the same result even if not stated explicitly.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 23-25, 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kosa (US 2001/0018168) in view of Ema (US 6,372,413).

Resist 11 is applied to the wafer substrate 10, exposed in a pattern and developed. A resist mixture 14 containing dissolved resist 13 and alkaline developer 15 remains. Ozone water 16 is dropped on the resist 11 to wash away the resist mixture 14 (reforming). See [0022]-[0023], [0032]. Kosa does not disclose irradiating the ozone water with light. Ema teaches a method for producing ozone water by supplying deionized water containing oxygen to a light irradiation unit emitting VUV light of 172 nm. See col.7, 34-45. It would have been obvious to one of ordinary skill in the art to produce ozone water in the method of Kosa by supplying deionized water containing oxygen to a light irradiation unit because Ema teaches that this is a known method for producing ozone water.

Applicant argues that the invention is to a pre-treatment which oxidizes the layer prior to the first development. It is not clear how a pre-

treatment of a pattern can occur before a development step has occurred and the pattern is formed. The claims do not recite an oxidation process. The recitation is much broader than that.

10. Claims 35-39, 40, 43-45, 47 and 48 are rejected under 35 U.S.C. 103(a) as being obvious over Takahashi (US 6, 818,387) in view of Ema.

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

A resist is coated on substrate 100, exposed through a mask and PEB. An aqueous solution of ozone is applied to the substrate surface, followed by

exposure to a developing solution. See col.5, 38-67. Takahashi does not disclose irradiating the ozone water with light. Ema teaches a method for producing ozone water by supplying deionized water containing oxygen to a light irradiation unit emitting VUV light of 172 nm. See col.7, 34-45. It would have been obvious to one of ordinary skill in the art to produce ozone water in the method of Takahashi by supplying deionized water containing oxygen to a light irradiation unit because Ema teaches that this is a known method for producing ozone water.

Applicant argues that Takahashi reference can be overcome with a statement of common ownership. The statement on the top of page 39 of the response includes "(and at all relevant times was)". The statement needs to clearly state that the application and reference were owned by the same entity at the time the invention was made.

Allowable Subject Matter

11. Claims 3-20, 132 and 133 are allowed.

Claims 26, 29-32 and 38 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

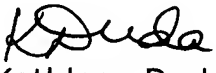
Claim 46 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

12. Any inquiry concerning this communication should be directed to Examiner K. Duda at (571) 272-1383. Official FAX communications should be sent to (571) 273-8300.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff, can be reached at 571-272-1385.

Information regarding the status of an application may be obtained from the Patent Application Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Kathleen Duda
Primary Examiner
Art Unit 1756